AMRL-TR-75-50
VOLUME 51




# USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

## VOLUME 51
## HH-53C IN-FLIGHT CREW NOISE

OCTOBER 1975





AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
Air Force Systems Command
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FOR THE COMMANDER

HENNING E. VON GIERKE
Director
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The HH-53C is a USAF heavy assault transport helicopter used to search, locate, and recover combat aircrew members, personnel, and/or vital aerospace hardware. This report provides measured data defining the bioacoustic environments at flight crew locations inside this helicopter during normal flight operations. Data are reported for 15 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level,

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perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

## PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 72310418, Measurement of Noise and Vibration Environments of Air Force Operations. Col Justus F. Rose, Jr. conducted the field measurements and performed the data analysis; Capt Nick Farinacci prepared this report.

The authors acknowledge the efforts of Mr. John N. Cole who established the data analysis requirements and assisted in the preparation of this report, and Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton who assisted in the mechanics of data processing.

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## List of Tables

## INTRODUCTION

The HH-53C is a USAF heavy assault transport helicopter used to search, locate, and recover combat aircrew members, personnel, and/or vital aerospace hardware. This helicopter, which is manufactured by the United Aircraft Corporation, Sikorsky Aircraft Division, is powered by two T64-GE-7 turboshaft engines rated at 3,925 shp at 13,600 rpm maximum power. The engines drive both a six-blade, fully-articulated, 22 m diameter main rotor, and a conventional four-blade 4.9 m diameter tail rotor. The engines are manufactured by the General Electric Company, Aircraft Engine Group, Military Engine Division.

This volume provides measured data defining the bioacoustic environments produced inside this helicopter. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the HH-53C helicopter.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and aerospace ground equipment. The far-field, community-type, noise data in the handbook describe the noise produced during *ground operations* of aircraft, aerospace ground equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. *Refer to Volume 1* (reference 1) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., in-flight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published, and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of the updated index as it is generated.

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1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application,* AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

## IN-FLIGHT NOISE

### MEASUREMENTS

All noise measurements were made on-board a standard-configured HH-53C helicopter during typical speed, altitude, and flight maneuver conditions. This helicopter had full factory insulation as compared with those helicopters flown in SEA from which the insulation was removed. These levels describe the standard HH-53C environments, but may not be representative of those levels encountered if the helicopter has been configured differently (e.g., major equipment or structural changes).

Acoustic measurements were made at various flight crew locations. Table 1 lists the measurement locations and test conditions as numeric/alphabetic designators which are used on the data pages. The designator 1/A means measurement location 1 and test condition A.

The microphone position was at ear level external to headgear in a region 0.2-0.3 meters from the head when an individual was present. At unoccupied locations, measurements were made at ear level throughout a volume where the head would normally be located. In both cases the microphone was randomly moved throughout a spherical volume approximately 0.3 meters in diameter and the resultant samples analyzed using a 4- or 8-second integration time to obtain a power-averaged level that effectively smooths out short-duration fluctuations and best describes the exposure.

Although the presence of a crew member at a measurement location affects the resultant sound field, the magnitude of such effects is generally small and not significant in determining exposure limits or voice communication capabilities. Consequently, no distinction is made in this report between occupied and unoccupied measurement locations.

### RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced inside the HH-53C helicopter at the 15 specified locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data C-weighted and A-weighted sound levels, maximum permissible time for one exposure per day (AFR 161-35) with and without standard Air Force ear protectors, preferred speech interference level, and perceived noise level are calculated and presented in Table 3. These variety of measures are widely used to assess the effects of noise on personnel and their performance.

TABLE 1

MEASUREMENT LOCATIONS AND TEST CONDITIONS

HH-53C, Eglin AFB, 11 May 1971
Serial # 69-5789

| *LOCATION* | *POSITION* | *HEIGHT ABOVE DECK* |
|---|---|---|
| 1 | Between Pilot and Copilot | Seated Head Level |
| 2 | Station 162 — Flight Engineers Station | Seated Head Level |
| 3 | Station 212, Centerline (1st row of Windows) | 1.5 Meters |
| 4 | Station 212, Left Side | Seated Head Level |
| 5 | Station 222 Centerline | 1.5 Meters |
| 6 | Station 302, Right Side | Seated Head Level |
| 7 | Station 312, Centerline (2nd row of Windows) | 1.5 Meters |
| 8 | Station 312, Left Side | Seated Head Level |

TABLE 1 (Continued)

## MEASUREMENT LOCATIONS AND TEST CONDITIONS

HH-53C, Eglin AFB, 11 May 1971
Serial # 69-5789

| *LOCATION* | *POSITION* | *HEIGHT ABOVE DECK* |
|---|---|---|
| 9 | Station 342, Centerline (Directly under gear box) | 1.5 Meters |
| 10 | Station 412, Centerline (3rd row of Windows) | 1.5 Meters |
| 11 | Station 412, Left Side | Seated Head Level |
| 12 | Station 500, Centerline (forward edge of ramp) | 1.5 Meters |
| 13 | Station 500, Left Side | 1.5 Meters |
| 14 | Just inside rescue door, Right Side | 1.5 Meters |
| 15 | Gunners Station on ramp | 1.5 Meters |

| *CONDITION* | *DESCRIPTION* |
|---|---|
| A | Internal APU running, ramp down, crew entrance door open. |
| B | Ground Idle — ramp up, crew entrance door closed. |

| | #1 Engine | | #2 Engine |
|---|---|---|---|
| Torque | 10% | | 10% |
| Ng | 65% | | 65% |
| T5 | 450°C | | 450°C |
| Rotor RPM | | 50% | |
| Fuel Flow | 250#/hr | | 250#/hr |

C — Taxi Power — ramp up, crew entrance door closed.

| | #1 Engine | | #2 Engine |
|---|---|---|---|
| Torque | 15% | | 15% |
| Ng | 80% | | 80% |
| T5 | 475°C | | 475°C |
| Rotor RPM | | 100% | |
| Fuel Flow | 300#/hr | | 300#/hr |

D — Lift off/climb — ramp up, crew entrance door closed.

| | #1 Engine | | #2 Engine |
|---|---|---|---|
| Torque | 80% | | 80% |
| Ng | 90% | | 90% |
| T5 | 500°C | | 500°C |
| Rotor RPM | | 100% | |
| Fuel Flow | 1200#/hr | | 1200#/hr |

E — Cruise — 1500' PA, 138 KIAS — ramp up.

| | #1 Engine | | #2 Engine |
|---|---|---|---|
| Torque | 55% | | 55% |
| Ng | 91% | | 91% |
| Tg | 560°C | | 560°C |
| Rotor RPM | | 100% | |
| Fuel Flow | 1000#/hr | | 1000#/hr |

F — Same as E — ramp down.

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TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 71-010-001
RUN 01

17 JAN 75

PAGE F1

NOISE SOURCE/SUBJECT:
HH-53C HELICOPTER
INFLIGHT NOISE LEVELS

OPERATION:

| FREQ (HZ) | LOCATION/CONDITION 1/B | 1/C | 1/E | 2/A | 2/B | 3/E | 4/E | 5/A | 6/B | 6/C |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 92 | 94 | 104 | 67 | 80 | 107 | 102 | 65 | 86 | 91 |
| 31.5 | 89 | 93 | 102 | 68 | 79 | 107 | 104 | 64 | 88 | 87 |
| 40 | 93 | 98 | 101 | 68 | 77 | 106 | 105 | 63 | 95 | 90 |
| 50 | 97 | 98 | 104 | 72 | 73 | 108 | 112 | 62 | 99 | 98 |
| 63 | 89 | 92 | 97 | 80 | 77 | 100 | 108 | 71 | 91 | 91 |
| 80 | 87 | 92 | 94 | 90 | 85 | 96 | 99 | 80 | 88 | 88 |
| 100 | 90 | 95 | 93 | 81 | 80 | 98 | 99 | 75 | 92 | 92 |
| 125 | 87 | 89 | 95 | 86 | 84 | 97 | 98 | 82 | 91 | 88 |
| 160 | 89 | 89 | 96 | 89 | 84 | 99 | 99 | 85 | 91 | 89 |
| 200 | 89 | 90 | 96 | 85 | 82 | 95 | 96 | 77 | 88 | 87 |
| 250 | 90 | 86 | 94 | 85 | 82 | 95 | 97 | 78 | 88 | 86 |
| 315 | 87 | 85 | 93 | 90 | 84 | 94 | 95 | 81 | 88 | 85 |
| 400 | 86 | 84 | 92 | 88 | 83 | 94 | 93 | 79 | 89 | 91 |
| 500 | 90 | 86 | 94 | 92 | 88 | 95 | 93 | 86 | 92 | 92 |
| 630 | 86 | 83 | 92 | 94 | 88 | 94 | 92 | 83 | 90 | 91 |
| 800 | 83 | 80 | 91 | 87 | 82 | 92 | 91 | 79 | 88 | 88 |
| 1000 | 82 | 79 | 89 | 84 | 80 | 90 | 90 | 77 | 85 | 85 |
| 1250 | 84 | 81 | 90 | 87 | 77 | 94 | 93 | 74 | 91 | 88 |
| 1600 | 81 | 79 | 89 | 79 | 77 | 91 | 90 | 73 | 89 | 85 |
| 2000 | 81 | 79 | 88 | 80 | 80 | 88 | 88 | 73 | 83 | 83 |
| 2500 | 80 | 79 | 86 | 79 | 77 | 89 | 88 | 69 | 88 | 91 |
| 3150 | 78 | 78 | 84 | 77 | 76 | 87 | 87 | 71 | 87 | 85 |
| 4000 | 78 | 79 | 83 | 78 | 78 | 87 | 87 | 72 | 83 | 85 |
| 5000 | 77 | 76 | 81 | 78 | 80 | 85 | 85 | 70 | 83 | 85 |
| 6300 | 78 | 76 | 80 | 78 | 78 | 85 | 85 | 67 | 83 | 81 |
| 8000 | 78 | 77 | 85 | 82 | 81 | 91 | 91 | 79 | 84 | 82 |
| 10000 | 74 | 74 | 80 | 74 | 78 | 85 | 85 | 67 | 81 | 79 |
| 12500 | 75 | 74 | 79 | 74 | 77 | 84 | 84 | 68 | 83 | 81 |
| 16000 | 76 | 76 | 82 | 76 | 78 | 87 | 88 | 76 | 84 | 83 |
| OVERALL | 103 | 104 | 111 | 100 | 96 | 114 | 115 | 93 | 105 | 104 |

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASUREU SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

IDENTIFICATION: OMEGA 3.2 TEST 71-010-001 RUN 02 17 JAN 75 PAGE F2

NOISE SOURCE/SUBJECT: HH-53C HELICOPTER INFLIGHT NOISE LEVELS

OPERATION:

| FREQ (HZ) | LOCATION/CONDITION 6/D | 7/E | 8/E | 9/E | 10/E | 11/E | 12/E | 13/E | 14/E | 15/F |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 98 | 102 | 102 | 100 | 99 | 99 | 100 | 102 | 102 | 109 |
| 31.5 | 96 | 99 | 100 | 100 | 103 | 103 | 98 | 100 | 102 | 108 |
| 40 | 98 | 103 | 104 | 104 | 104 | 103 | 103 | 105 | 105 | 111 |
| 50 | 101 | 111 | 109 | 105 | 113 | 115 | 114 | 111 | 107 | 111 |
| 63 | 94 | 100 | 105 | 99 | 102 | 106 | 102 | 103 | 107 | 102 |
| 80 | 90 | 94 | 100 | 96 | 94 | 104 | 97 | 103 | 102 | 100 |
| 100 | 91 | 93 | 104 | 98 | 98 | 102 | 104 | 107 | 102 | 104 |
| 125 | 91 | 93 | 99 | 94 | 94 | 101 | 99 | 104 | 103 | 98 |
| 160 | 91 | 95 | 97 | 97 | 95 | 102 | 100 | 103 | 102 | 101 |
| 200 | 90 | 93 | 94 | 92 | 94 | 96 | 97 | 97 | 100 | 98 |
| 250 | 90 | 92 | 94 | 92 | 93 | 97 | 95 | 100 | 99 | 97 |
| 315 | 90 | 91 | 90 | 92 | 93 | 97 | 95 | 99 | 99 | 98 |
| 400 | 91 | 91 | 92 | 93 | 92 | 94 | 95 | 98 | 99 | 98 |
| 500 | 94 | 93 | 94 | 98 | 93 | 93 | 94 | 94 | 101 | 97 |
| 630 | 90 | 91 | 91 | 92 | 91 | 90 | 92 | 89 | 100 | 96 |
| 800 | 89 | 90 | 89 | 90 | 89 | 89 | 91 | 88 | 98 | 95 |
| 1000 | 87 | 88 | 89 | 89 | 88 | 88 | 88 | 87 | 98 | 94 |
| 1250 | 99 | 96 | 96 | 100 | 95 | 95 | 93 | 93 | 98 | 95 |
| 1600 | 95 | 92 | 92 | 93 | 91 | 90 | 88 | 88 | 97 | 92 |
| 2000 | 88 | 88 | 89 | 88 | 88 | 87 | 84 | 83 | 97 | 91 |
| 2500 | 94 | 91 | 93 | 95 | 91 | 89 | 87 | 86 | 96 | 89 |
| 3150 | 90 | 89 | 90 | 89 | 88 | 86 | 84 | 82 | 94 | 87 |
| 4000 | 87 | 86 | 87 | 89 | 85 | 84 | 81 | 79 | 96 | 87 |
| 5000 | 84 | 85 | 85 | 87 | 83 | 82 | 80 | 78 | 94 | 84 |
| 6300 | 81 | 84 | 84 | 84 | 83 | 81 | 79 | 77 | 95 | 84 |
| 8000 | 87 | 90 | 88 | 86 | 86 | 83 | 82 | 80 | 101 | 85 |
| 10000 | 82 | 85 | 84 | 83 | 83 | 82 | 79 | 77 | 95 | 83 |
| 12500 | 82 | 86 | 84 | 83 | 83 | 82 | 79 | 78 | 95 | 85 |
| 16000 | 85 | 89 | 86 | 86 | 86 | 85 | 82 | 80 | 98 | 87 |
| OVERALL | 108 | 113 | 114 | 111 | 114 | 117 | 115 | 115 | 115 | 117 |

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
OCTAVE BAND

NOISE SOURCE/SUBJECT:
HH-53C HELICOPTER
INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION:
OMEGA 3.2
TEST 71-010-001
RUN G1

17 JAN 75

PAGE J1

| FREQ (HZ) | LOCATION/CONDITION 1/B | 1/C | 1/E | 2/A | 2/B | 3/E | 4/E | 5/A | 6/B | 6/C |
|---|---|---|---|---|---|---|---|---|---|---|
| 31.5 | 96 | 100 | 107 | 72 | 84 | 112 | 108 | 69 | 96 | 94 |
| 53 | 98 | 100 | 105 | 90 | 86 | 109 | 114 | 81 | 100 | 99 |
| 125 | 93 | 97 | 99 | 91 | 88 | 103 | 103 | 87 | 96 | 95 |
| 250 | 93 | 92 | 99 | 92 | 88 | 99 | 101 | 84 | 92 | 91 |
| 500 | 92 | 89 | 97 | 96 | 91 | 99 | 97 | 88 | 95 | 96 |
| 1000 | 88 | 85 | 94 | 91 | 85 | 97 | 96 | 82 | 93 | 92 |
| 2000 | 85 | 84 | 92 | 84 | 83 | 94 | 93 | 77 | 92 | 92 |
| 4000 | 82 | 82 | 88 | 82 | 83 | 91 | 91 | 76 | 90 | 90 |
| 8000 | 82 | 81 | 87 | 84 | 84 | 93 | 93 | 79 | 88 | 85 |
| 16000 | 78 | 78 | 84 | 78 | 81 | 89 | 89 | 76 | 86 | 85 |
| OVERALL | 103 | 104 | 111 | 100 | 96 | 114 | 115 | 93 | 105 | 104 |

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT:
HH-53C HELICOPTER
INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION:
OMEGA 3.2
TEST 71-010-001
RUN 02
17 JAN 75
PAGE J2

| FREQ (HZ) | LOCATION/CONDITION 6/D | 7/E | 8/E | 9/E | 10/E | 11/E | 12/E | 13/E | 14/E | 15/F |
|---|---|---|---|---|---|---|---|---|---|---|
| 31.5 | 102 | 106 | 107 | 106 | 107 | 107 | 105 | 107 | 108 | 114 |
| 63 | 102 | 111 | 111 | 106 | 113 | 115 | 114 | 112 | 110 | 112 |
| 125 | 96 | 98 | 105 | 101 | 101 | 106 | 106 | 110 | 107 | 106 |
| 250 | 95 | 97 | 98 | 97 | 98 | 101 | 100 | 104 | 104 | 102 |
| 500 | 97 | 96 | 97 | 100 | 97 | 97 | 99 | 100 | 105 | 102 |
| 1000 | 99 | 98 | 97 | 101 | 96 | 97 | 96 | 95 | 103 | 99 |
| 2000 | 97 | 95 | 96 | 98 | 95 | 94 | 92 | 91 | 101 | 95 |
| 4000 | 92 | 92 | 93 | 93 | 90 | 89 | 87 | 85 | 99 | 91 |
| 8000 | 89 | 92 | 90 | 89 | 89 | 87 | 85 | 83 | 102 | 89 |
| 16000 | 86 | 90 | 88 | 88 | 88 | 87 | 83 | 82 | 99 | 89 |
| OVERALL | 108 | 113 | 114 | 111 | 114 | 117 | 115 | 115 | 115 | 117 |

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

NOISE SOURCE/SUBJECT: HH-53C HELICOPTER INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION: OMEGA 3.2 TEST 71-010-001 RUN 01

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| | LOCATION/CONDITION | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1/B | 1/C | 1/E | 2/A | 2/B | 3/E | 4/E | 5/A | 6/B | 6/C |
| **HAZARD/PROTECTION** | | | | | | | | | | |
| C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR | | | | | | | | | | |
| A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR | | | | | | | | | | |
| MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) | | | | | | | | | | |
| NO PROTECTION | | | | | | | | | | |
| OASLC | 102 | 103 | 109 | 100 | 96 | 112 | 114 | 92 | 104 | 103 |
| OASLA | 94 | 92 | 100 | 97 | 92 | 102 | 102 | 89 | 99 | 99 |
| T | 85 | 120 | 30 | 50 | 120 | 21 | 21 | 202 | 36 | 36 |
| HGU-2A/P HELMET WITH H-154 | | | | | | | | | | |
| OASLA* | 86 | 85 | 92 | 86 | 82 | 94 | 94 | 79 | 88 | 87 |
| T | 339 | 404 | 120 | 339 | 679 | 85 | 85 | 960 | 240 | 285 |
| HGU-2A/P HELMET WITH H-154(A) | | | | | | | | | | |
| OASLA* | 82 | 81 | 88 | 82 | 77 | 89 | 91 | 74 | 83 | 82 |
| T | 679 | 807 | 240 | 679 | 960 | 202 | 143 | 960 | 571 | 679 |
| HGU-2A/P HELMET WITH CUSTOM LINER | | | | | | | | | | |
| OASLA* | 90 | 88 | 96 | 93 | 88 | 98 | 97 | 85 | 93 | 93 |
| T | 170 | 240 | 60 | 101 | 240 | 42 | 50 | 404 | 101 | 101 |
| V-51R EAR PLUGS | | | | | | | | | | |
| OASLA* | 71 | 69 | 77 | 73 | 68 | 79 | 79 | 65 | 74 | 74 |
| T | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 960 |
| H-157 IN-FLIGHT COMMUNICATION UNIT | | | | | | | | | | |
| OASLA* | 78 | 79 | 84 | 78 | 73 | 86 | 88 | 70 | 80 | 79 |
| T | 960 | 960 | 480 | 960 | 960 | 339 | 240 | 960 | 960 | 960 |
| **COMMUNICATION** | | | | | | | | | | |
| PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB) | | | | | | | | | | |
| PSIL | 88 | 86 | 95 | 90 | 86 | 97 | 96 | 82 | 93 | 93 |
| **ANNOYANCE** | | | | | | | | | | |
| PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB) | | | | | | | | | | |
| TONE CORRECTION (C IN DB) | | | | | | | | | | |
| PNLT | 109 | 108 | 114 | 111 | 106 | 118 | 118 | 103 | 114 | 116 |
| C | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 |

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

NOISE SOURCE/SUBJECT:

HH-53C HELICOPTER
INFLIGHT NOISE LEVELS

OPERATION:

IDENTIFICATION:

OMEGA 3.2
TEST 71-010-001
RUN 02

27 APR 75

PAGE H2

| | LOCATION/CONDITION | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6/D | 7/E | 8/E | 9/E | 10/E | 11/E | 12/E | 13/E | 14/E | 15/F |
| HAZARD/PROTECTION | | | | | | | | | | |
| C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR | | | | | | | | | | |
| A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR | | | | | | | | | | |
| MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) | | | | | | | | | | |
| NO PROTECTION | | | | | | | | | | |
| OASLC | 107 | 112 | 112 | 110 | 113 | 116 | 114 | 115 | 114 | 115 |
| OASLA | 104 | 102 | 103 | 105 | 101 | 102 | 101 | 102 | 109 | 104 |
| T | 15 | 21 | 18 | 13 | 25 | 21 | 25 | 21 | 6 | 15 |
| HGU-2A/P HELMET WITH H-154 | | | | | | | | | | |
| OASLA* | 89 | 92 | 93 | 92 | 92 | 96 | 94 | 98 | 99 | 96 |
| T | 202 | 120 | 101 | 120 | 120 | 60 | 85 | 42 | 36 | 60 |
| HGU-2A/P HELMET WITH H-154(A) | | | | | | | | | | |
| OASLA* | 85 | 87 | 89 | 88 | 89 | 92 | 91 | 94 | 94 | 92 |
| T | 404 | 285 | 202 | 240 | 202 | 120 | 143 | 85 | 85 | 120 |
| HGU-2A/P HELMET WITH CUSTOM LINER | | | | | | | | | | |
| OASLA* | 97 | 97 | 97 | 99 | 96 | 98 | 98 | 100 | 103 | 100 |
| T | 50 | 50 | 50 | 36 | 60 | 42 | 42 | 30 | 18 | 30 |
| V-51R EAR PLUGS | | | | | | | | | | |
| OASLA* | 77 | 78 | 78 | 79 | 78 | 80 | 79 | 81 | 84 | 81 |
| T | 960 | 960 | 960 | 960 | 960 | 960 | 960 | 807 | 480 | 807 |
| H-157 IN-FLIGHT COMMUNICATION UNIT | | | | | | | | | | |
| OASLA* | 82 | 85 | 88 | 85 | 86 | 90 | 89 | 91 | 91 | 89 |
| T | 679 | 404 | 240 | 404 | 339 | 170 | 202 | 143 | 143 | 202 |
| COMMUNICATION | | | | | | | | | | |
| PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB) | | | | | | | | | | |
| PSIL | 98 | 97 | 97 | 99 | 96 | 96 | 95 | 95 | 103 | 99 |
| ANNOYANCE | | | | | | | | | | |
| PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB) | | | | | | | | | | |
| TONE CORRECTION (C IN DB) | | | | | | | | | | |
| PNLT | 119 | 119 | 120 | 121 | 118 | 120 | 118 | 119 | 124 | 119 |
| C | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 |

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.



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